

## DE46 | Digital Differential Pressure Switch / Transmitter

The DE46 is a multi-function differential pressure switch with an optional transmitter signal output. It is suitable for accurate measurement of low positive / negative gauge pressure or differential pressure of air and gases.

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Examples of applications:

- Air conditioning and ventilation systems
- Environmental monitoring
- Clean rooms and laboratories

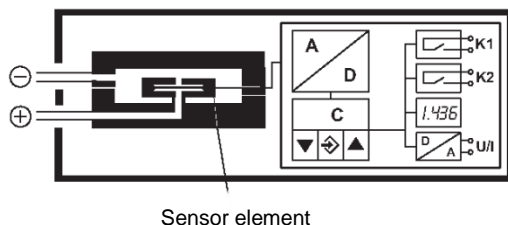
### Principles of Operation

The instrument is based on a capacitance sensor element and can measure positive gauge, negative gauge or differential pressure.

The pressure is measured directly by a micro machined silicon-on-glass capacitance sensor element. The instrument's internal microcontroller transfers the measured value to its LED display and operates the two internal limit relays whose contacts are used for alarm and/or control functions. With the transmitter option, the measured value is transmitted as a voltage or current signal output after conversion by a D/A converter stage.

The output signal can be filtered, scaled and inverted accurately and easily by digital means.

### Functional Scheme

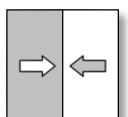


### Features

- Low pressures measurable without long-term drift
- Robust design; over-pressure protected; maintenance-free
- Optional transmitter signal output that can be accurately scaled, adjusted for zero offset anywhere in the specified pressure range, and inverted if needed
- Non-linear measurements can be linearized using a user-programmable look-up table of up to 30 points
- All settings / adjustments can be done from a PC using optional EU03 PC Adaptor

### Typical Applications

- Condition monitoring of filters
- Precision air duct measurements
- Clean room pressure balance monitoring
- Burner air feed low pressure detection
- Oven air feed control



**Technical data**

Basic measuring range	Pa	0-25	0-50	0-100	0-250	0-500	0-1000	- 25...+ 25	- 50...+ 50	- 20...+ 80	- 100...+ 100
Max. stat. operating pressure	bar	1.0									
Bursting pressure	bar	1.7									
Minimum characteristic curve deviation	%FS	1.0									
Reproducibility °	%FS	0.1									
Max. TK Range and zero point°°	%FS/10K	0.6									

°: Characteristic curve deviation (non-linearity and hysteresis) at 25°C, basic measuring range (linear characteristic curve, not spread)  
 °°: with reference to the basic measuring range (not spread), compensation range 4...50°C.

	<b>General points</b>	
Admissible ambient temperature	-10 ... 70°C	
Admissible media temperature	-10 ... 70°C	
Admissible storage temperature	-20 ... 70°C	
Enclosure protection class	IP 65 acc. to DIN EN 60529	
	<b>Electrical data</b>	
Nominal voltage	24 V DC / AC	
Admissible operating voltage $U_b$	20 ... 32 V DC / AC	
Electrical connection type	Three-wire	
Output signal	Current output	Voltage output
	0 ... 20 mA, 4 ... 20 mA	0 ... 10 V DC
Admissible apparent ohmic resistance	$R_L \leq (U_b - 4 \text{ V}) / 0,02 \text{ A}$ ( $U_b \leq 26\text{V}$ ) $R_L \leq 1100\Omega$ ( $U_b > 26\text{V}$ )	$R_L \geq 2 \text{ K}\Omega$
Characteristic curve	can be programmed	
Power consumption	approx. 2 W / VA	
Display	3.5 character LED	
	<b>Switch contacts</b>	
Relay contacts	2 potential-free relay contacts programmed as NO contact or NC contact $U_{\max} = 32\text{V AC/DC}$ , $I_{\max} = 2 \text{ A}$ , $P_{\max} = 64 \text{ W/VA}$	
Semiconductor switch	2 potential-free semiconductor switches (MOSFET), SPST-NO/NC progr. $U = 3 \dots 32\text{V AC/DC}$ , $I_{\max} = 0.25\text{A}$ , $P_{\max} = 8 \text{ W/VA}$ , $R_{\text{ON}} \leq 4 \Omega$	
	<b>Connections</b>	
Process connection	Hose screw connections made of Al, 6/4 mm or 8/6 mm	
Electr. connection	2 x round plug connector M12 Connector 1 for supply and analogue output signal (5-pole, male) Connector 2 for switch contacts (4-pin, male)	
	<b>Materials</b>	
Casing	Polyamide PA 6.6	
Media-contacting material	Silicon, PVC, aluminium, brass	
	<b>Assembly</b>	
	Bore-holes on the reverse side for attachment of the assembly panels. Wall mounting by means of assembly plate. If the device is intended for outdoor use, we recommend permanently protecting the membrane keypad against UV radiation and using a suitable enclosure or at least the erection of a sufficiently dimensioned canopy as a protection measure against constant rain or snow.	

## Programming

Programming is carried out via the membrane keypad and menu navigation; can be locked with a password

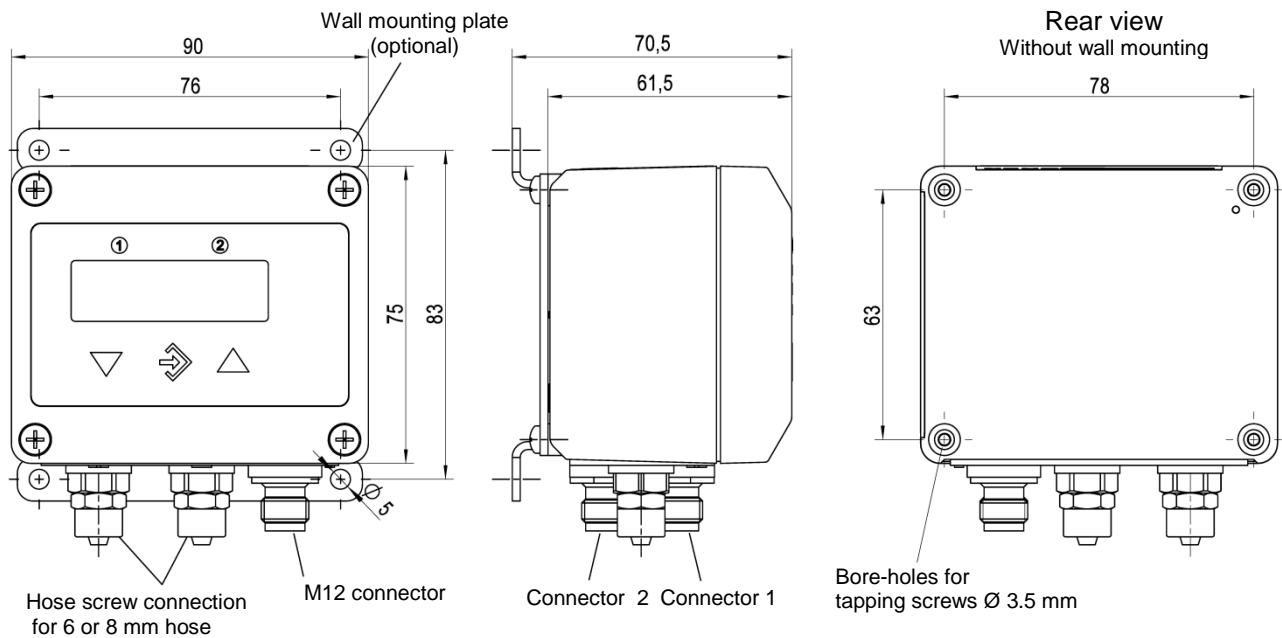
	Settings
Attenuation	0.0 ... 100.0 s (jump response time 10 / 90 %) for signal output; separately also for display
Switching output 1 / 2	Switch-off point, switch-on point, response time (0...100s), function (NC / NO contact)
Measuring range unit	mbar / Pa / "free unit", starting value, end value and decimal point for "free unit"
Zero-point stabilising	0 ... 1/3 of the basic measuring range (1)
Output signal	User-definable within the basic measuring range (2)
Zero point correction	$\pm 1/3$ of the basic measuring range (3)
Implementation of characteristic curve	Linear, square rooted, flat cyl. tank, table with 3...30 support points
Password	001 ... 999 (000 = no password protection)

Comments:

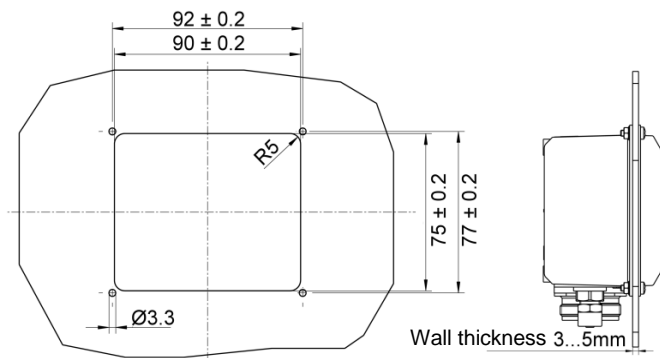
- (1): Measuring values (around zero) are set to zero. (E.g. to suppress seepage).
- (2): Maximum effective spread 4:1. Only the output signal is influenced.
- (3): This in turn enables a decreasing characteristic curve, if the start of the measuring range > end of the measuring range.
- (3): Zero point correction for compensation of various installation positions.

## Dimensional drawings

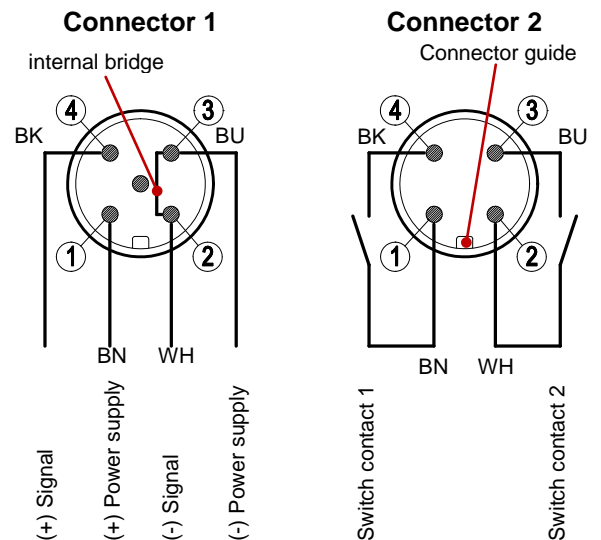
(all dimensions in mm unless otherwise specified)



## Panel mounting



## Connection diagram



**Order Codes**

**Digital differential pressure switch / transmitter,  
with 3 1/2-digit LED display**

Type DE46 

		0	0			N			M	
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**Measuring ranges**

- 0... 25 Pa..... > D 1
- 0... 50 Pa..... > J 6
- 0... 100 Pa..... > D 4
- 0... 250 Pa..... > D 6
- 0... 500 Pa..... > J 7
- 0... 1000 Pa..... > D 9
- 25.0... +25.0 Pa..... > L 5
- 50.0... +50.0 Pa..... > L 2
- 20.0... +80.0 Pa..... > L 0
- 100.0... +100.0 Pa..... > L 7

**Pressure connection**

- Aluminium screw connection for 6 / 4 mm hose ..... 4 0
- Aluminium screw connection for 8 / 6 mm hose ..... 4 1

**Electrical output signal**

- without analogue electrical output signal..... > 0
- 0 – 20 mA 3-wire (STANDARD) ..... > A
- 0 – 10 V DC 3-wire (STANDARD) ..... > C
- 4 – 20 mA 3-wire (STANDARD) ..... > P

**Operating voltage**

- 24 V DC/AC (20 - 32 V DC/AC) ..... > N

**Measuring unit**

- Standard pressure units..... > 0

**Measured value display / contact elements**

- 3 1/2-digit-LED – 2 relay contacts ..... > 3
- 3 1/2-digit-LED – 2 semiconductor switches ..... > 6

**Electrical connection**

- M12 plug connection ..... > M

**Assembly option**

- Standard (attachment boreholes on rear side) ..... > 0
- Assembly of the mounting rails ..... > S
- Panel mounting set..... > T
- Wall mounting..... > W

**Accessories**

Order Code	Designation	No. of Poles	Usage	Length
06401993	Connection cable with M12 connector	4-pole	for switching outputs	2 m
06401994	Connection cable with M12 connector	4-pole	for switching outputs	5 m
06401995	Connection cable with M12 connector	5-pole	for supply / signal	2 m
06401996	Connection cable with M12 connector	5-pole	for supply / signal	5 m
EU03.F300	Adapter for parameterisation via PC software			

